

Rock SPG S

Koupler Siren Control

SERVICE MANUAL

for

CD&F Siren Decoder

Models: SC1 and SC2

CD & F ELECTRONICS CORP.
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CD&F SIREN DECODER
INSTALLATION INSTRUCTIONS

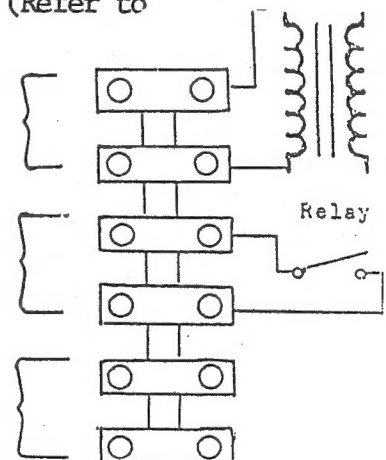
The following instructions will aid the user in obtaining the most satisfaction in using their CD&F Siren Decoder.

1. Inspect the unit, inside and out, for indications of damage during transit; notify CARRIER immediately if damage has occurred.
2. Mount cabinet to wall or pole using the two mounting holes provided on the inside and rear of the cabinet. (Pole mounting brackets are provided in a separate plastic bag, if needed.)
3. Attach antenna to top of chassis.
4. CAUTION - The main power used by the decoder is 120VAC or 240VAC. Wiring the main power should be completed by a qualified electrician using local electrical codes.
5. Insert wiring for Decoder power through one of the knock-out vent plugs provided at the bottom of the cabinet. Use wires, conduit, fittings, and ground chassis as specified by local electrical codes. Connect output device that is to be controlled. (Refer to terminal block diagram below.)

120/240 VAC Input

1st Relay Switched
Contacts (10Amp.
Maximum)

2nd Relay Switched
Contacts (Optional)



Attach the (GROUND WIRE) to the stud located at the bottom of the sub-chassis.

6. Apply power to decoder.
7. The CD&F Siren Decoder is now ready to be test activated with a command from a transmitter/encoder.

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CD&F SIREN DECODER
SPECIFICATIONS

FUNCTIONS AVAILABLE:

1. Standard Civil Defense Functions
2. Separate Fire Functions
3. Additional Functions Available

PRINTED CIRCUIT CONSTRUCTION:

Removable (Plug-in) Modules are used throughout the circuitry. Visual indicators are used on most modules for ease of troubleshooting and repair.

FREQUENCY CONTROL:

Precision Fixed Frequency
Quartz Crystals Control Frequency
Stability; + 0.0025% from -30°C to +60°C
148-174 MHz bands.

SELECTIVITY:

6db Maximum @ + 6KHz
60 db Minimum @ + 30 KHz

SPURIOUS REJECTION:

50db Minimum

TONE SENSITIVITY:

Activation at 0.26uv
or less for 148-174MHz.

TONE ACTIVATION:

By two sequential tones with audio frequencies up to 2900 Hz. tone timing dependent upon customer requirements.

TONE FREQUENCY BANDWIDTH:

Dependent upon customer requirements.

RELAY CONTACT RATING:

10 AMP @ 240VAC

VOLTAGE REQUIREMENTS:

120 or 240VAC, 60Hz

CABINET:

18 gauge zinc-coated steel
painted yellow

DIMENSIONS:

21" high x 11" wide x 3½" deep

WEIGHT:

21 lbs. maximum

CRYSTAL FREQUENCY CALCULATION

Crystal Frequency = Radio Frequency \pm 10.7 MHz

(25-33) Rf+10.7 (33-54) Rf-10.7

Crystal Frequency = $\frac{\text{Radio Frequency} - 10.7 \text{ MHz}}{3}$

(148-174 MHz radio frequency range)

CD&F ELECTRONIC SIREN CONTROL

The unit is a dual conversion, narrow band, FM receiver. The signal from the antenna is coupled through the antenna coil L1 to the RF amplifier Q1, Q2 and the first mixer, produces the first IF of 10.7 MHz from the RF and the first local oscillator frequency. The first local oscillator Q4 and Q5 (Q5 is omitted on low band) is crystal controlled. The fundamental is used on low bands and Q5, the tripler is used for the high band units. The first IF of 10.7 MHz is mixed with the frequency of the second local oscillator Q3, which is crystal controlled, producing the second IF of 455 KHz. This signal is then coupled to the IF, limiter, discriminator integrated circuit (U1).

The audio is coupled to the decoder tone filter circuit consisting of the phase locked loop, PLL, and its circuitry. The decoder will activate, upon receiving the proper tone frequency and timing, pulsing the selected timer module which in turn activates the relay. The relay will stay closed or cycle depending upon the selected timer.

The power supply consists of a 115VAC or 230VAC transformer stepped down to 15VAC. The fullwave bridge rectifier and filters provide the input voltage to the three pin 12 volt DC regulators. The relay is connected to the unregulated DC voltage. The receiver, the timer modules and the decoder modules have on-board 12 volt regulators.

-GENERAL INFORMATION-

The CD&F Siren Decoder is a single frequency narrow band FM receiver & decoder designed to operate in the frequency ranges of 25 to 54 MHz and 148 to 174 MHz. The decoder operates by two sequential tones and controls a 10 Amp. dry contact relay.

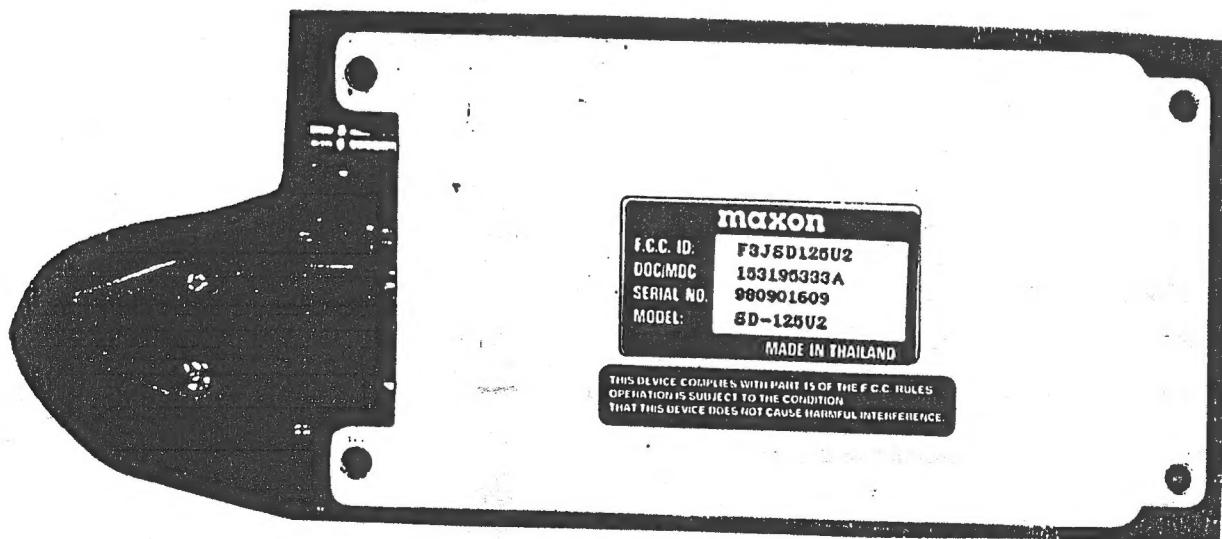
-STANDARD EQUIPMENT-

SC1 Low Band
(25-54 MHz) - Civil Defense Function w/cancel or
SC2 High Band
(150-174 MHz) - Civil Defense Function w/cancel
117V AC or 234V AC Power Supply
10 Amp. Heavy Duty Relay
Duotone or Two Tone Sequential (282-3000Hz)
Tone Timing depending on customer requirement
Manual start and stop switches
Service Manual
Bottom Mount UHF Antenna Connector
Cabinet Painted CD Yellow



F.C.C. Information

The F.c.c. I.D. is located on the underside of the chassis.
The serial number will differ and the VHF units will be
SD125V1.



MAXON

SD-125 RF LINK MODULE

Frequency Bands:

	RX	TX
VHF: V1	136.000 - 162.000 MHz	136.000 - 162.000 MHz
V2	148.000 - 174.000 MHz	148.000 - 174.000 MHz
UHF: U2	440.000 - 470.000 MHz	440.000 - 470.000 MHz
U1	400.000 - 430.000	400.000 - 430.000
U5	420.000 - 450.000	420.000 - 450.000
U3	470.000 - 490.000	470.000 - 490.000
U4	490.000 - 512.000	490.000 - 512.000

Dimensions..... (30 mm)H x (62 mm)W x (118 mm)D

Weight 253 grams

RECEIVER

Sensitivity (12dB Sinad)..... UHF < -117 dBm, VHF < -118 dBm @ Nom. Condition
 UHF < -115 dBm, VHF < -116 dBm @ Extreme Condition

Amplitude Characteristic..... < -3 dB

Adjacent Channel Selectivity:

25 kHz Channel Spacing > 60 dB @ Nom., > 55 dB @ Extreme Condition

12.5 kHz Channel Spacing..... > 50 dB @ Nom., > 45 dB @ Extreme Condition

Spurious Response Rejection..... 70 dB (100 kHz - 4 GHz)

Image Response..... > 70

IF Response..... > 70

Others..... > 70

Intermodulation Response Rejection:

±25 kHz/ 50 kHz..... 65 dB

±50 kHz/ 100 kHz..... 65 dB

Conducted Spurious Emission @ Nominal Conditions:

9 kHz - 1 GHz..... < -57 dBm

1 GHz - 4 GHz..... < -47 dBm

RX Spurious Emissions (Radiated) @ Nominal Conditions

9 kHz - 1 GHz..... < -57 dBm

1 GHz - 12.75 GHz..... < -47 dBm

SPECIFICATIONS

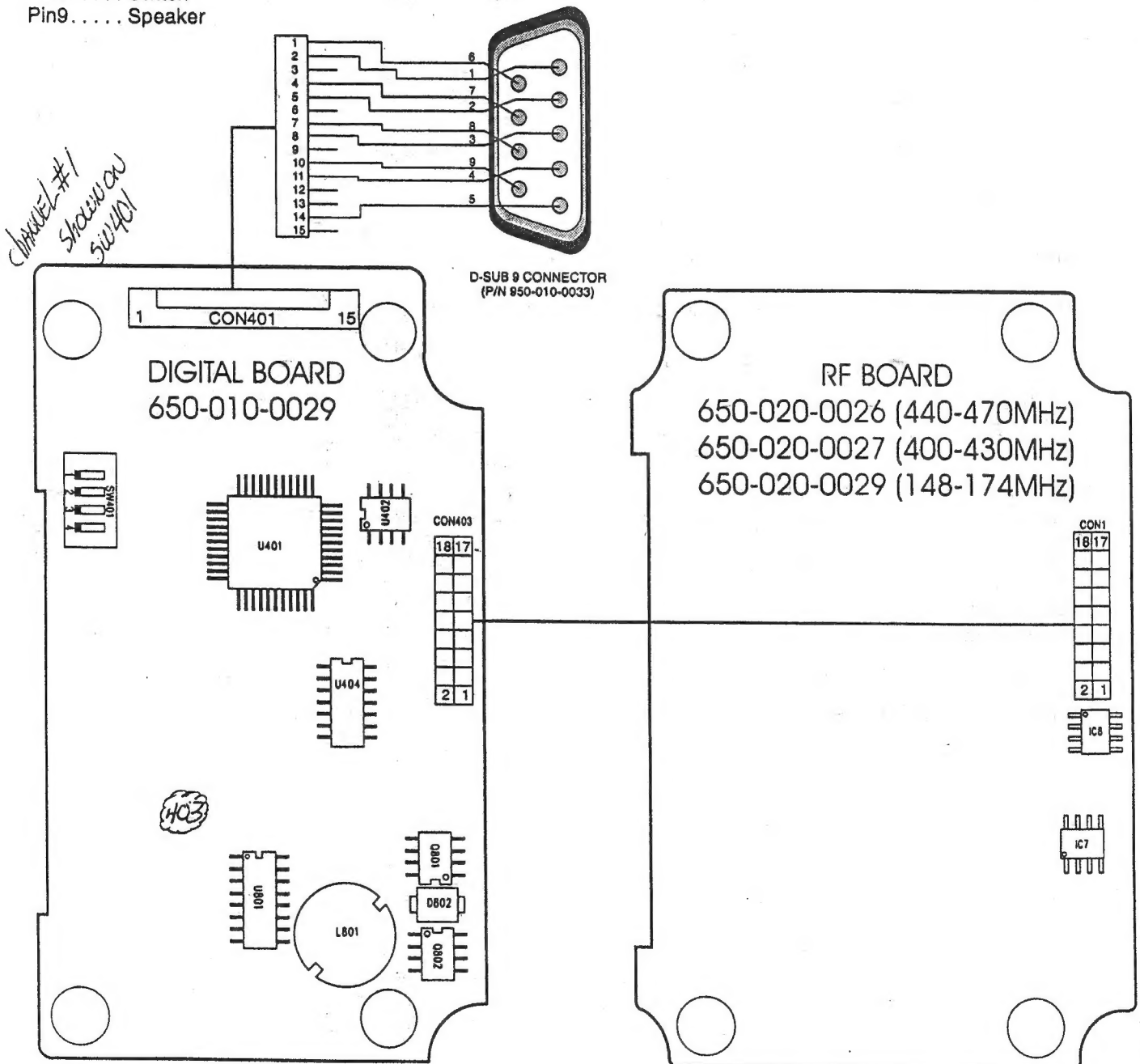
GENERAL

Equipment Type	Data radio
Performance Specifications	TIA / EIA-603 & ETS 300-113
Band	UHF / VHF
Channel Spacings	25 kHz, 12.5 kHz programmable
RF Output Power	5/1 watt
Modulation Type.....	F3D, F3E
Intermediate Frequency.....	45.1 MHz & 455 kHz
Number of Channels.....	16
Frequency Source	Synthesizer
Operation Rating	Intermittent 90 : 5 : 5 (Standby: RX: TX)
Power Supply.....	Ext. Power Supply(12 VDC Nominal Voltage) 9.0V - 15.0V DC EXTREME
Temperature Range	
Storage	from - 40 C to + 80 C
Operating	from - 30 C to + 60 C
Current Consumption	
Standby (Muted).....	< 65 mA
Transmit 5 Watts RF Power	< 2.0 A
Transmit 1 Watt RF power	< 1.0 A

MAXON SD-125 RF LINK MODULE

WIRING DIAGRAM

- Pin1..... Audio In (Data RX)
- Pin2..... Audio Out (Data TX) — WHITE
- Pin3..... PTT
- Pin4..... GND (Ground) — BLACK
- Pin5..... B+ (8-18 Volts DC) — RED
- Pin6..... Carrier Detect (Squelch)
- Pin7..... N/C No Connect
- Pin8..... Switch
- Pin9..... Speaker



MAXON SD-125 RF LINK MODULE

AF Distortion..... < 5% @ Nom., < 10 % @ Extreme condition

AX Hum & Noise:

25.0 kHz CP < 40 dB No PSOPH

12.5 kHz CP < 40 dB with PSOPH

Receiver Response Time..... < 16 mS

Squelch Opening Range: RF level for 6 to 14 dB Sinad

Squelch Closing Range (Hysteresis):..... 0 - 6 dB Sinad @ Nominal Condition

Squelch Attack Time:

RF Level at Threshold < 40 mS

RF Level at Threshold + 20 dB..... < 30 mS

Squelch Decay Time 5 mS Min., 20 mS Max.

Antenna Socket Input Match..... > 10 dB Return Loss

L.O. Frequency Temperature Stability 1st < 5 ppm, 2nd < 15 ppm from -30 to + 60 C

L.O. Frequency Aging Rate -2 ppm/ year

REFERENCE CRYSTAL

Frequency 12.8 MHz

Holder Type..... HC-18

Temperature Characteristic -5.0 ppm from -30 C to +60 C

Aging Rate..... < 2 ppm/ year in 1st year
< 1 ppm/ year thereafter

Lock Time < 10 mS

to RX < 20 (No Power Saving)

RX to TX < 20

MAXON SD-125 RF LINK MODULE

ENVIRONMENTAL (performance without degradation unless stated)

Temperature deg C

Operating..... -30 to +60 C Degradation Specified @ Extreme

Storage..... -40 to +80 C

Recharging..... -10 to +55 C

ESD..... 20 kV (C-MIC \geq 15 kV)

Vibration MIL STD 810 C Procedures I, II, V and IEC68 26

PROGRAMMER

Programmer (Interface Module)..... ACC-2000

Programmer (Interface Cable) QPA-4000

Programmer (Software)..... ACC-900

- *Due to continuing research and development the company reserves the right to alter these specifications without prior notice.*

OPTIONS

Fire Function w/cancel (steady or cycle)

- D1 Thermostat Controlled Heater
- D2 CTCSS Decoder
- D3 Top Deck Mount VHF Low Band Antenna
- D4 Top Deck Mount VHF High Band Antenna
- D5 Additional 10A Heavy Duty Relay
- D6 Cabinet Painted Red
- D7 Additional Intermodulation Filter
- D8 Audio Kit (for servicing Decoders)
- D9 Test Transmitter Encoder
- D10 Additional Tone Filter for individual operation

CD&F ELECTRONIC SIREN CONTROL

Model # SC (1, 2, or 3)

(P, M, G or F) (0) - 101

SC = Siren Control

1 = Low Band

2 = High Band

3 = UHF

P = Plectron timing & tones

M = Motorola timing & tones

G = General Electric timing & tones

0 = Revision number

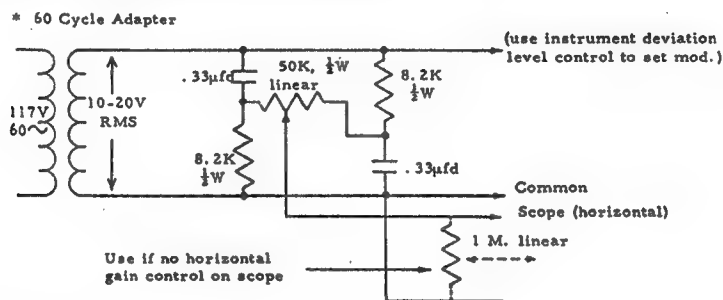
FCC ID: F498POCDF- CD&F ELECTRONICS CORP.			
ELM CREEK, NE. 68836			
RF	MHZ	CTCSS	HZ
SERIAL NO.			
SHIPPED			
TONES #1		HZ #4	HZ
#2		HZ #5	HZ
#3		HZ #6	HZ
OUTPUTS			
TONES-ON-OFF		TIMING	
#1			
#2			
#3			
#4			
AC POWER INPUT		VAC	

AC INPUT | RELAY #1 | RELAY #2

ALIGNMENT

Recommended Test Equipment

- Frequency counter capable of 0.001% or better accuracy
- RF Sweep Generator (measurements, 800 FM signal generator or equivalent with 60 cycle sweep adapter
- 60 Hz cycle sweep as shown.



- Voltmeter (HP427A or equivalent) with high impedance
- Oscilloscope with 10:1 impedance probe and 10 MHz band width
- Audio sequential tone generator

RF MODULE ALIGNMENT

1. Set up test equipment

- Connect 60 cycle sweep to RF generator for external modulation and scope horizontal input
- Connect RF generator (RF out) through -10db attenuator to the UHF antenna connector on cabinet

2. Adjust RF generator to decoder RF frequency. (Check with frequency meter)

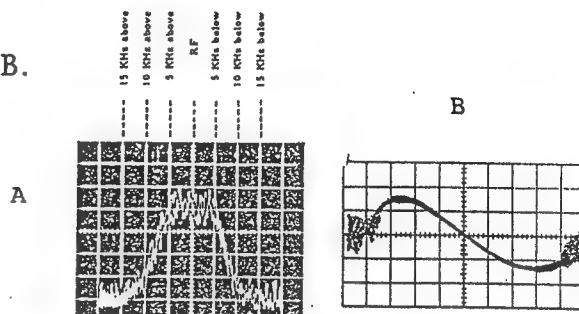
3. Set oscilloscope probe to R16 (side nearest center of board) and set scope sensitivity to 0.01 V/CM

4. Set scope time division to X - Y

5. Adjust trace for center of oscilloscope

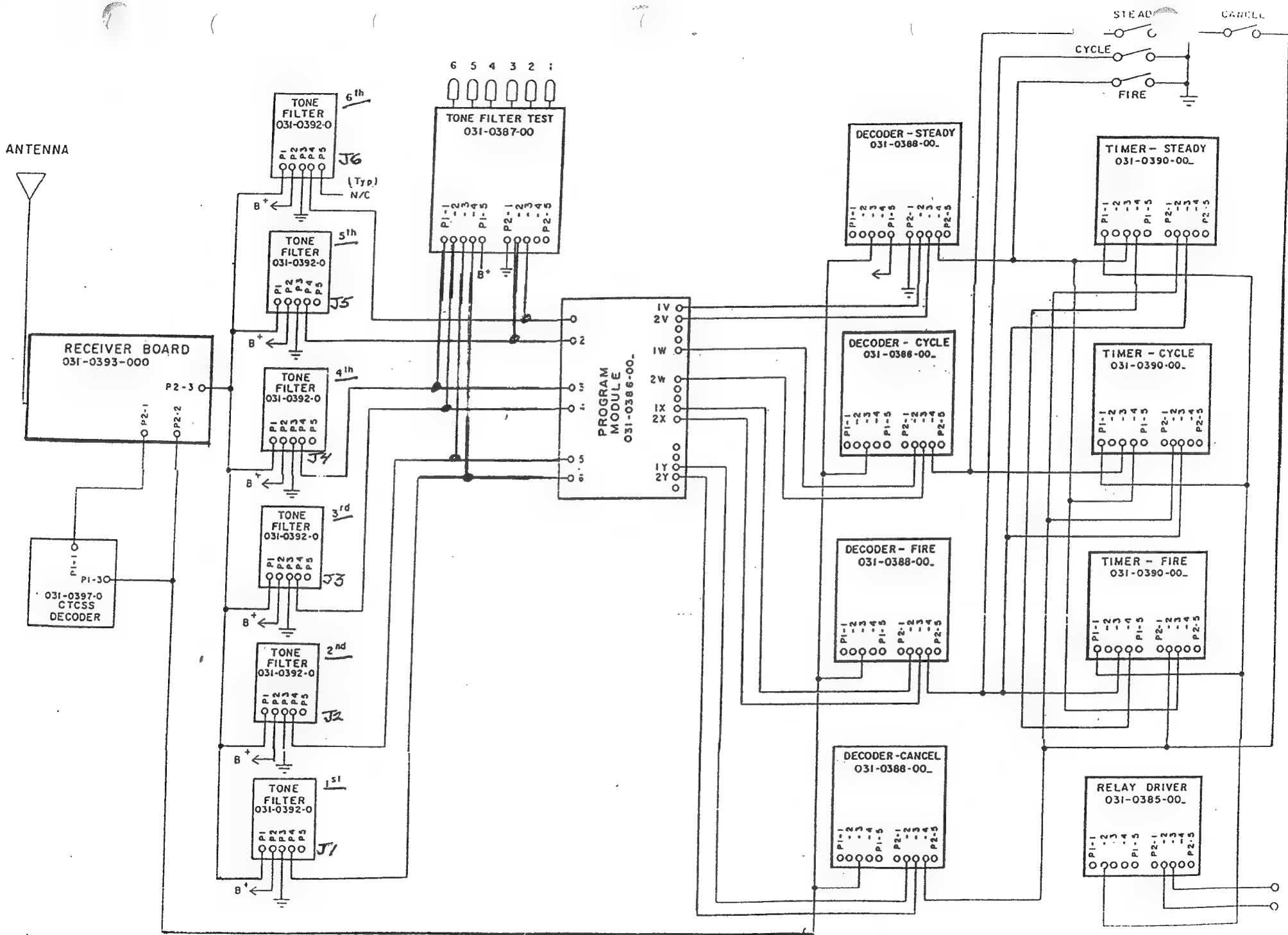
6. Turn on 60 Hz sweep

7. Set the RF generator output for band pass on scope. See example A.
8. With alignment tools, tune (in order) L5, (L6, L7 if high band), T2, T1, L3, L2 and L1 for maximum bandpass. Reduce RF generator as needed.
9. Remove scope probe and connect it to TP1.
10. Tune T3 for S-curve shaping. See example B.
11. Tune C29 for centering S-curve on scope.
12. Turn off 60 cycle sweep.
13. Set 1000 KHz tone @ 2KHz deviation.
14. Check for AF at TP1 and TP2.
15. Set two tone generator for activation tone and timing. (See decoder model label for tones and timing.)
16. Connect two tone generator to external mod. of RF generator.
17. Set modulation at 2KHz deviation for both tones
18. Reduce RF generator and activate tone generator.
19. Adjust RF generator to locate decode activation sensitivity.

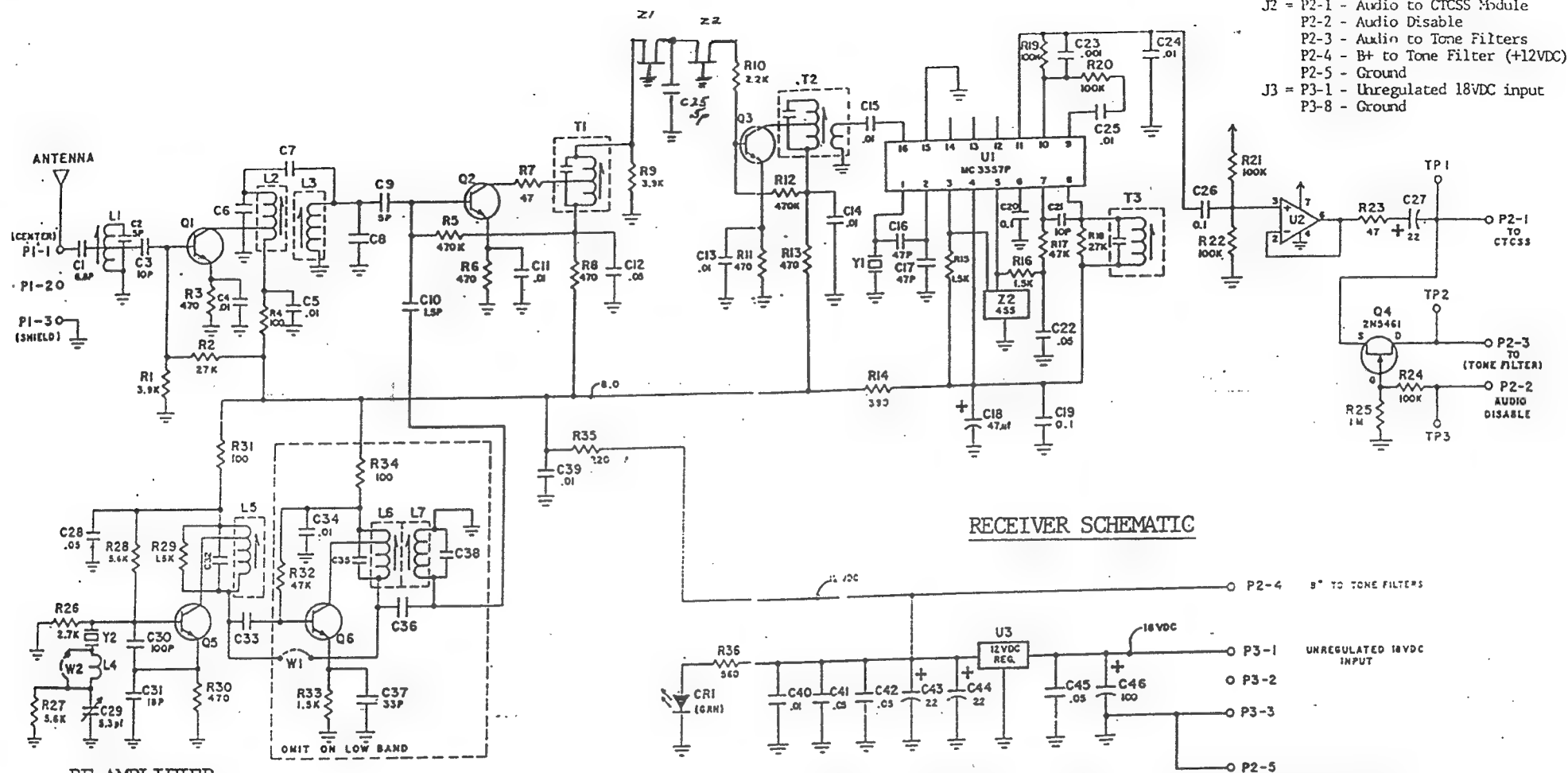


TONE FILTER ALIGNMENT

1. Set RF generator on RF frequency.
2. Set TONE generator on continuous tone and set tone at tone filter frequency (listed on tone filter).
3. Monitor Pin 4 (no tone - +10-12VDC, activated +0-1VDC).
4. Adjust R3 fully clockwise.
5. Slowly adjust R3 until output of Pin 4 drops to 0VDC. (LED will lite)
6. Check system requirements for tone bandwidth in \pm per cent.
7. Set tone generator for the lower frequency and activate.
8. Set tone generator for the higher frequency and activate.



BLOCK DIAGRAM



RF AMPLIFIER

The RF receiver is a narrow band, FM receiver, that is crystal controlled. The RF signal from the antenna is coupled through the antenna coil L1 to the RF Amplifier, Q1. Then L2 and L3 are turned to the RF frequency and reject other unwanted RF. This is then coupled to the Q2 RF Amplifier along with 1st oscillator frequency.

OSCILLATOR

The first local oscillator Q5 is crystal controlled. The fundamental crystal frequency is used on Q5, found in the Low Band Decoder. The High Band Decoder has the added circuitry of Q6.

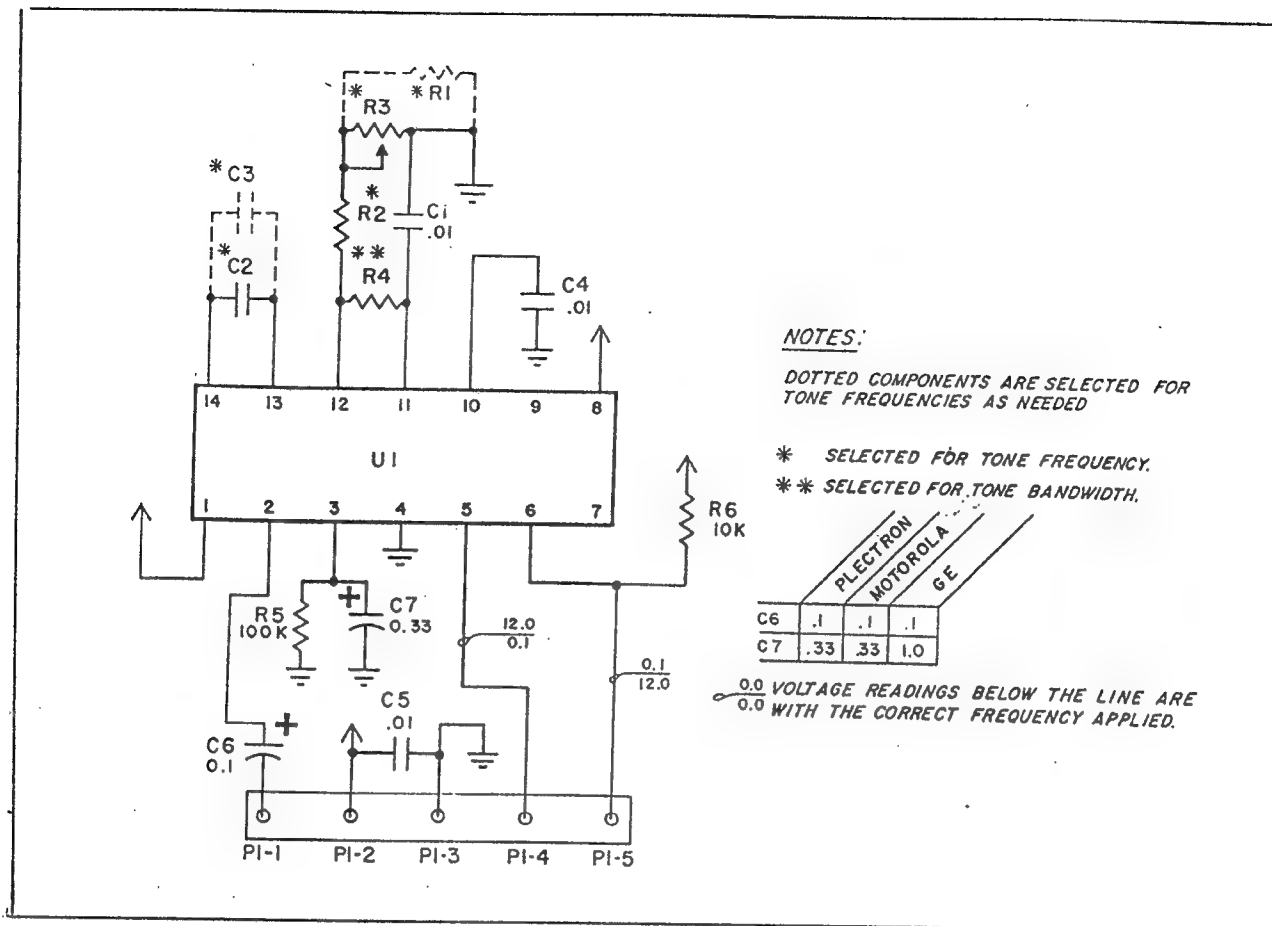
FIRST IF

The first IF of 10.7 MHz is produced as the difference of the RF frequency and the first local oscillator frequency. Z1 then filters the 10.7 MHz IF and Q3 amplified the IF. Coupled through T2, the signal is passed on to U1

SECOND IF

The second local oscillator is crystal controlled (Y1) and is fed into U1 Pin 1, mixed with the 10.7 MHz produces a 455 KHz IF. U1 (MC3357P-1C) is a limiting IF amplifier/quadrant detector, contains the second local oscillator, mixer, IF, limiter and discriminator. Audio is recovered from P11 of U1 fed to audio amp U2.

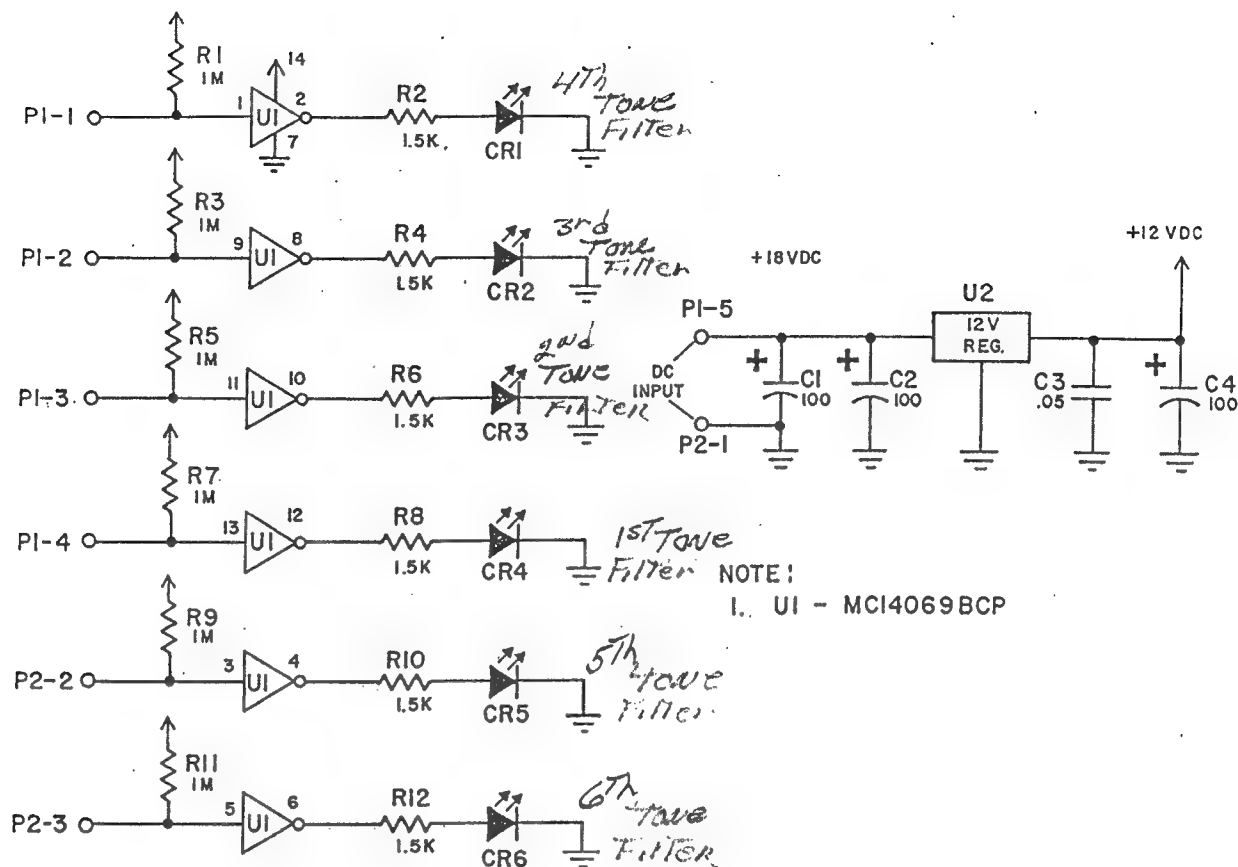
SCX X1-XXXX ()
↑ USE MAXON RX



TONE FILTER

The tone filter is designed to receive the AF on Pin 1 at 50MVAC to 1VAC. The components C2, C3, R4 and the potentiometer R3 determine AF detection frequency. R4 determines the bandwidth of the tone filter. When the AF is of proper tone frequency the output on Pin 4 will drop to +0-1VDC from +10-12VDC.

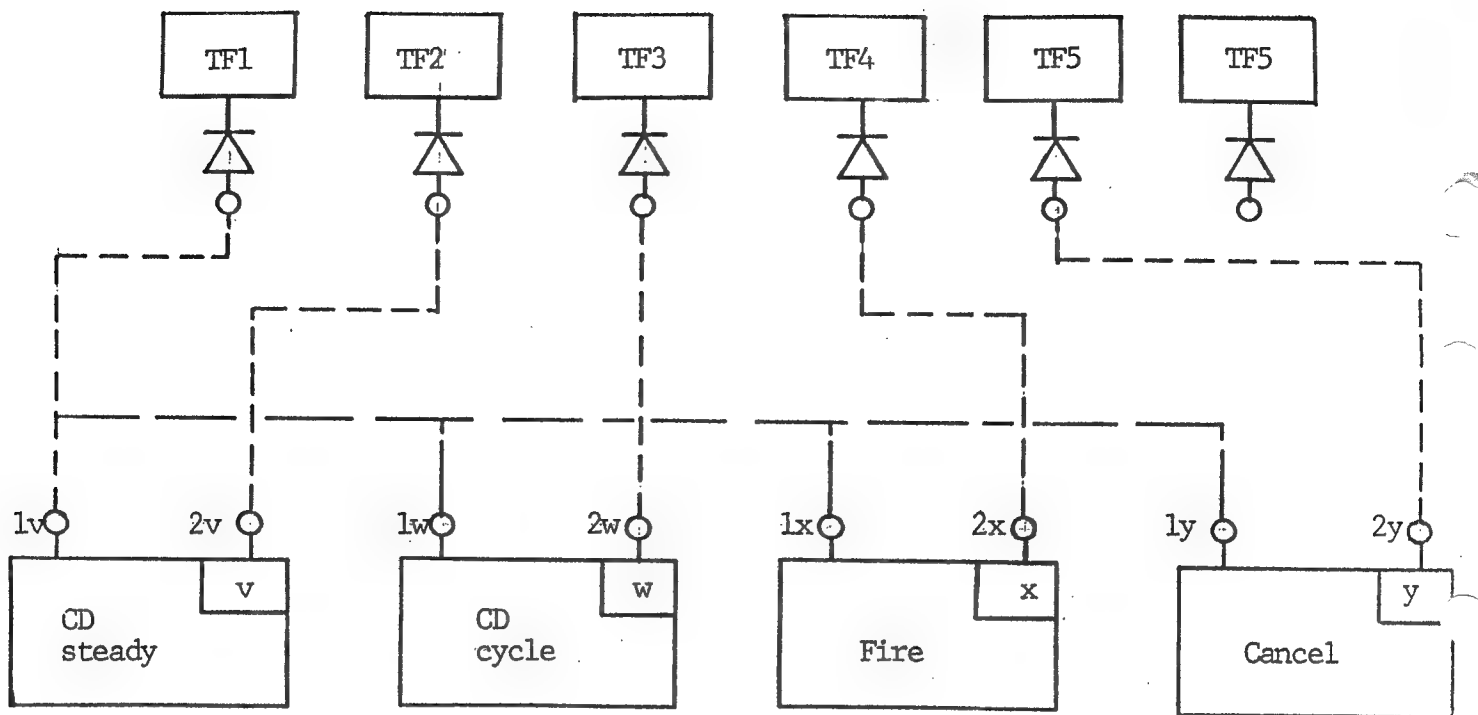
J1 through J6 =	P1-1	Audio input (50MVAC to 1VAC)
	P1-2	B+ (+12VDC + 1VDC @ 6maDC)
	P1-3	Ground
	P1-4	Logic output (12VDC normal 0-1VDC activated)
	P1-5	Not used



tone filter test module

The power input @ P1-5 and P2-1 is 18VDC unregulated. C1 and C2 provide additional filtering and U2 regulates the voltage to 12VDC. C3 and C4 are filtering for the 12VDC. A ground or 0VDC from a tone filter at P1-1 input is inverted to a positive voltage and powers the visual indicator, CR1. This indicates the tone filter is sensing an audio input whose frequency is within the bandwidth of the tone filter module.

The above description is repeated for visual indicators CR2 through CR6 and their associated inputs.



EXAMPLE:

	A	B	Tone A	Tone B
CD steady	100 - 200		Jumper TF1 to 1V	TF2-2V
CD cycle	100 - 300		Jumper TF1 to 1W	TF3-2W
Fire	100 - 400		Jumper TF1 to 1X	TF4-2X
Cancel	100 - 500		Jumper TF1 to 1Y	TF5-2Y

PROGRAM MODULE

This module is set at the factory to determine the two tones required for a steady, cycle, fire and cancel function. The output for the tone filter 1-6 are connected to CR1-CR6 respectively. Each diode output is then jumpered to the appropriate tone sequence for the siren function.

V - function is for CD steady

W - function is for CD cycle

X - function is for fire

Y - function is for cancel

TONE PROGRAM EXAMPLE:

Tone 1 - 100 Hz

Tone 2 - 200 Hz

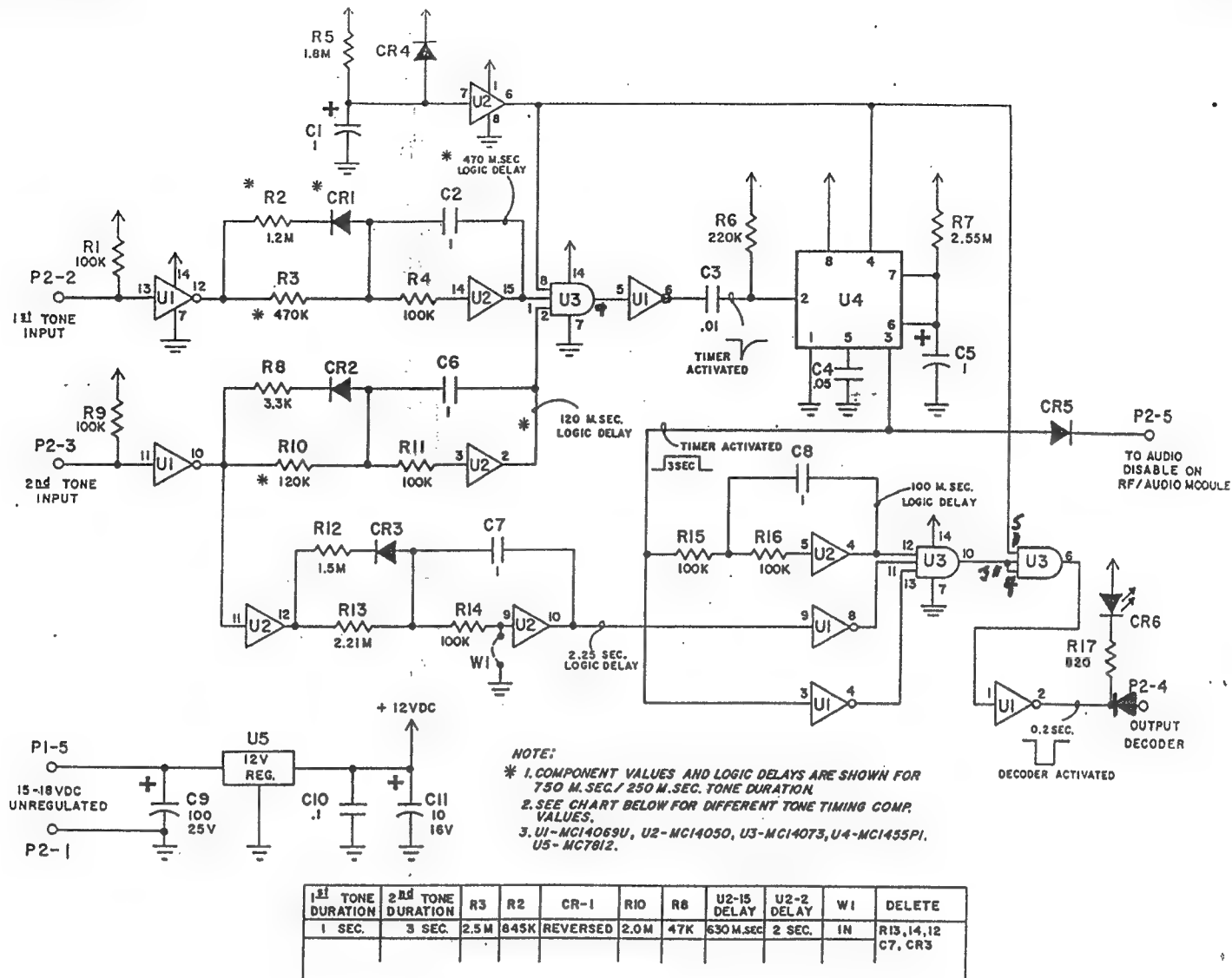
Tone 3 - 300 Hz

Tone 4 - 400 Hz

Tone 5 - 500 Hz

Example: 1st tone is common, 2nd tone function

In the example above the #1 tone filter is common for all functions. The #2 tone filter is used to activate the CD steady. The jumpers are then wired as #1 tone filter from CR1 to the 1V line of holes. The #2 tone filter is jumpered from CR2 to 2V line.



DECODER MODULE

The Decoder module accepts a logic output from each of the two tone filter modules, and, if the timing sequence and duration are correct, send a logic "zero" output to activate a cycle timer or timer module.

A 0VDC logic signal from a tone filter module to P2-2 starts a timing function for U2-15. The timing components are C2, R2, R3, and CR1 and the component values are dependent upon which timing format the decoder is to be used with. Example: Normally R3=470k, R2=1.2M, and CR1 positioned as shown on schematic. The P2-2 "grounding" input must be present at least for U2-15 to switch to a high state. (Or 67% of the 1st tone duration for the timing format used.) AP2-3 "grounding" input from a second tone filter module must be present for 67% of the second tone duration to change U2-2 to a high state. When both U3-1 and 2 are high, U3-9 will go high and U1-6 will go low, triggering U4 timer.

Note: U3-8 normally high except during "power-up" when it is low, therefore disabling U3-9, U4-3 and U3-6 outputs. This prevents the siren from turning ON upon applying power to the decoder or during momentary power interruptions.

U4-3 output performs two functions:

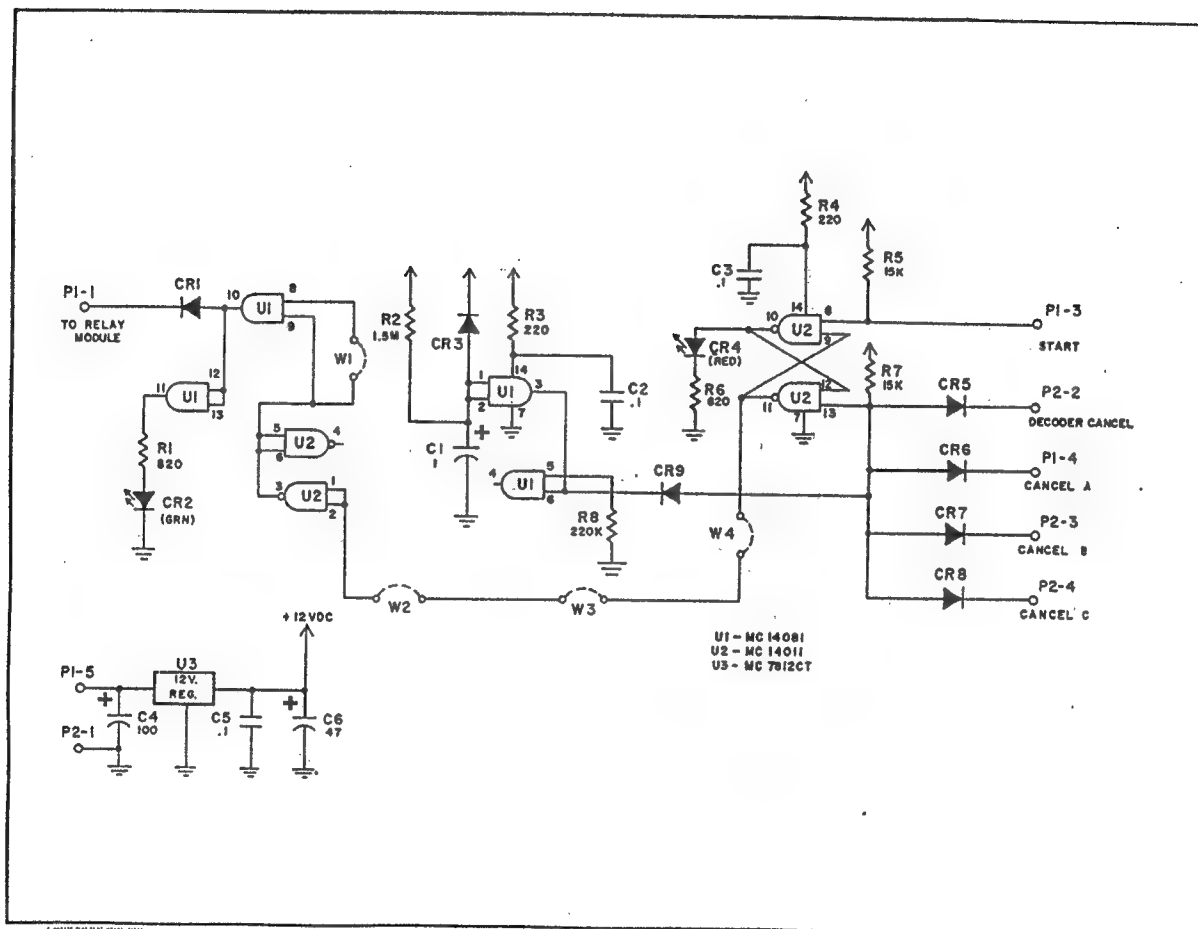
- 1) disables the audio via P2-5 to the RF/audio module to prevent possible reverse tone activation.
- 2) provides a three second logic delay to check for a 2nd tone being too long (two seconds or more) prior to sending an output from the decoder module (via P2-4).

Note: If the second tone is too long, U2-10 will be high and U1-8 low, thus preventing U3-10 from going high. The timing components are C7 and R13 for approximately 2.25 second delay for a long second tone duration.

STEADY TIMER

The STEADY time is the same as the cycle time except for the "on" - "off" timer of U3 and SW2 and SW3 are not used.

With a logic Low on P1-3 the total timer is activated. The switches closed on SW1 set the timing of total relay activation. W1 is used in place of U3 and the cycle timer so a High is on Pins 8 & 9 of U1.

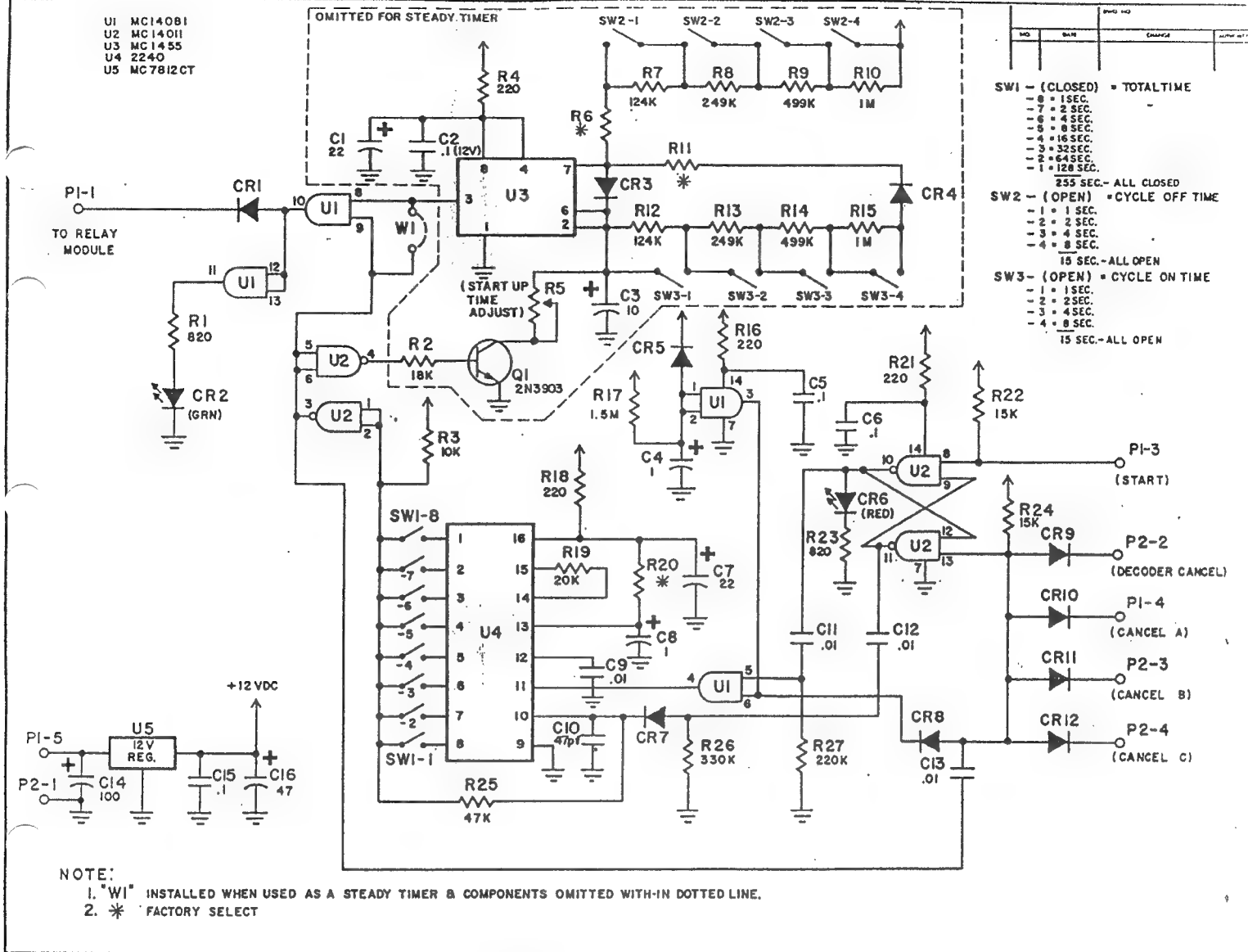


TONE - ON, TONE - OFF MODULE (OPTION)

The tone-on tone-off module is used to activate a siren with a two-tone sequence and deactivate the siren with a different two-tone sequence. This module would be connected in place of the timer module.

The logic Low from the decoder enters at P1-3 to U2 (Pin 8). U2 Pin 10 then goes High, activating CR4, LED and U2 (Pin 12) goes High driving U2 (Pin 11) Low. This Low goes to U2 (Pin 1 & 2) creating a High on U2 (Pin 3). The logic High on U1 (Pin 8 & 9) produces a High on U1 (Pin 10), the output to the relay module. U1 (Pin 11) is then driven High to light CR2.

A cancel or logic low on P2-2 or P1-4 or P2-3 or P2-4 will create a High on U2 (Pin 11). The High will reset CR4, LED and produce a Low on U2 (Pin 3). This Low will reset U1 Pin 10 to Low, turning off CR2 and resetting the relay to off.



STEADY, CYCLE TIMER

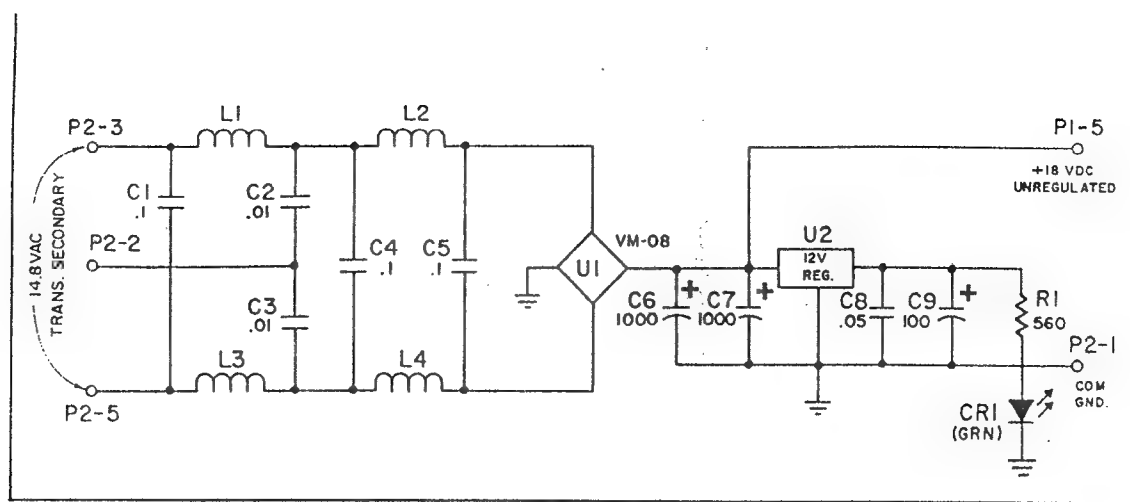
The cycle timer is used to cycle the relay driver, to cancel the relay and set the timing of the siren cycle and total time.

The output trigger of the cycle decoder or fire decoder enters the cycle timer on P1-3 to U2 NAND Gate Pin 8. The logic low will activate U2, Pin 10 to go high, turning on CR6 LED and is traced to U1, Pin 5. The AND Gate Output U1 (Pin 4) goes high and triggers U4 total time on the output of U4 is Dip Switch 1, SW1-1 through SW1-8. SW1 is used to set the total time of the cycle. (Refer to table on drawing) Total time is set by closing the switches required for total time the siren is to be activated. When the total timer U4 is activated a logic low is output on to SW1, which puts a low on U2 Pins 1 & 2. The High on Pin 3 pass on to U2 Pin 5 & 6 and also U1 Pin 9. The high a U2 produces a low on Pin 4, activating Q1, triggering cycle timer U3. Switches SW2 and SW3 are used to set the "off" and "on" time of the relay (refer to table on drawing) Timing is set by opening the switch.

The output of U3 (Pin 3) is activated to a logic High and with the High on U1 (Pin 9), produces a High on U1 (Pin 10). Output P-1 to the Relay Driver is then High during "on" times and CR2, LED is lit.

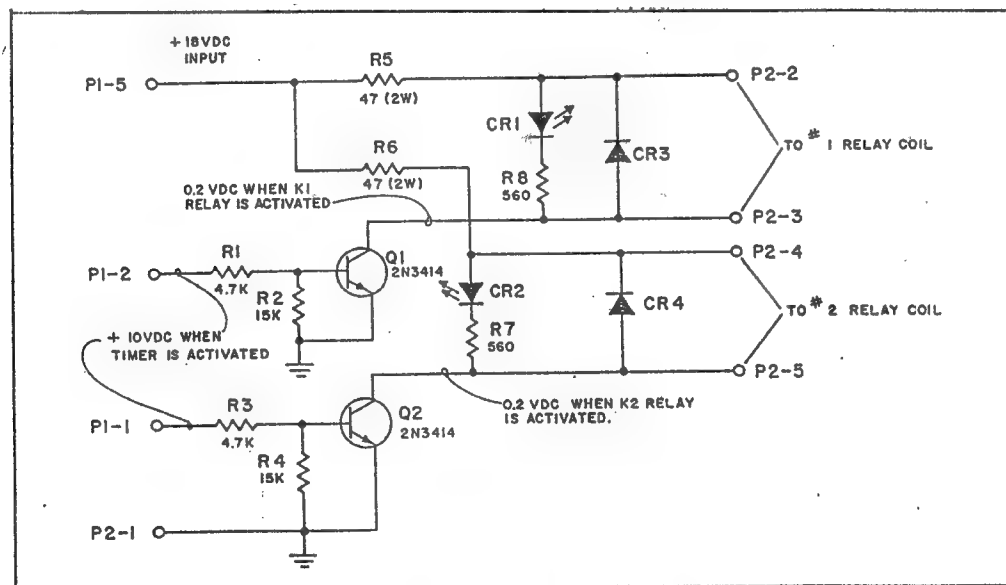
When U3 Pin 3 goes Low, the output of U1 (Pin 10) is low and the "off" time is passed to the Relay Driver. The LED, CR2, is off during this time.

If a cancel INPUT goes logic low (P2-2, -3, -4 or P1-4), U2 (Pin 13) goes Low and U2 (Pin 11) goes logic High, U2 (Pin 10) is cut off, the total timer U4 is reset and U2 (Pin 1 & 2) are set to High causing the Relay to deactivate.



POWER SUPPLY MODULE

Approximately 15VAC is applied from the power transformer secondary to terminals P2-3 and 5. Capacitors C1 through C5 and L1 through L4 form a filter to eliminate noise and transients from the power lines. The 15VAC is rectified by the bridge rectifier, U1, and filtered by C6 and C7 into 18VDC unregulated. U2 regulates the voltage into 12VDC and C8/C9 provide the filtering. R1 and light emitting diode, CR1, provide the power indicator for the module.



RELAY DRIVER MODULE

Eighteen volts dc is always available at P1-5 for power to K1 and K2 relay coils. The K1 relay is activated whenever 10VDC is present at P1-2 to turn on Q1 which "grounds" P2-3 and the bottom side of K1 relay coil. K2 relay is activated when 10VDC is present at P1-1 to turn on Q2 and hence K2 relay.

PARTS LIST

Power Supply 50-0384-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>		<u>Part #</u>
C1, 4, 5	3	CFCe, .1mfd	20% ^{50V} 12V	5-0026-000
C2, 3	2	CFCe, .01mfd	20% 25V	5-0024-000
C6, 7	2	CFCe, 1000mfd	20% 25V	5-0035-000
C8	1	CFCe, .05mfd	20% 25V	5-0024-002
C9	1	CFCe, 100 mfd	20% 25V	5-0216-000
CR1	1	LED, Green Clear		28-0018-002
U1	1	IC, Bridge Rectifier VM08		15-0011-000
U2	1	IC, Regulator, MC7812CT	12V	15-0012-000
L1, 2, 3, 4	4	Coil, Choke	22uh	27-0396-000
R1	1	RFC, 560 ohm	5% 1/3w	23-0013-066
P1, 2	2	Connector, Friction Lock Block, 5 circuit		8-0063-000

Receiver Assembly 50-0390-00	Lo	25-33 MHz
	1	Lo 33-43 MHz
	2	Lo 43-54 MHz
	3	Hi 148-160 MHz
	4	Hi 160-174 MHz

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>		<u>Part #</u>
J1-3	2	Connector, header 3 position		8-0399-001
J2	1	Connector, header		8-0399-000
C1	1	CFCe, 6.8 pf	20% 1000v	5-0028-003
C6	1	CFCe, 6.8 pf	20% 1000v	5-0028-003
C1, 3, 21	3	CFCe, 10 pf	20% 1000v	5-0028-003
C1, 3, 6, 8, 31	5	CRCe, 18 pf	20% 100 v	5-0029-000
C2, 6, 8	3	CFCe, 68 pf	20% 100 v	5-0029-003
C2, 8, 9, 33, 35, 38	6	CFCe, 5 pf	20% 1000v	5-0028-002
C9, 10	2	CFCe, 5 pf	20% 1000v	5-0028-002
C4, 5, 11, 13, 14, 15, 24, 25, 34, 36, 39, 40	12	CFCe, .01mfd	20% 25 v	5-0024-000

Receiver Assembly

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
C6	1	CFCe, 8.2pf	20% 1000v 5-0028-004
C6, 8, 32, 37	4	CFCe, 33pf	20% 1000v 5-0027-000
C7, 10, 36	3	CFCe, 1.5pf	20% 1000v 5-0028-000
C12, 22, 28, 41, 42	6	CFCe, .05mfd	20% 25v 5-0024-002
45	2	CFCe, 47pf	20% 1000v 5-0027-001
C16, 17	1	CFCe, 47mfd	20% 16v 5-0033-000
C18	3	CFCe, .1mfd	20% 12v 5-0026-000
C19, 20, 26	1	CFCe, .001mfd	20% 25v 5-0025-000
C23	3	CFE, 22mfd	20% 16v 5-0032-000
C27, 43, 44	1	CFV, 5-30pf	Variable 5-0037-000
C29	1	CFCe, 100pf	20% 100v 5-0029-002
C30	1	CFCe, 20pf	20% 25v 5-0029-001
C32	1	CFE, 100mfd	20% 25v 5-0216-000
C46	1	LED, Green Clear	28-0018-002
CRL	1		
U1	1	IC, MC3357P	15-0007-000
U2	1	IC, TL018CP	15-0091-000
U3	1	IC, Regulator, MC7812CT	15-0012-000
R1, 26	2	RFC, 2.7K	5% 1/4w 23-0013-082
R1, 9	2	RFC, 3.9K	5% 1/4w 23-0013-086
R2	1	RFC, 27K	5% 1/4w 23-0013-106
R3, 6, 8, 11,	7	RFC, 470ohm	5% 1/4w 23-0013-064
13, 17, 30.	5	RFC, 1.5K	5% 1/4w 23-0013-048
R3, 33, 15, 16, 19	2	RFC, 100ohm	5% 1/4w 23-0013-048
R4, 31	1	RFC, 470ohm	5% 1/4w 23-0013-048
R34	2	RFC, 400K	5% 1/4w 23-0013-136
R5, 12	2	RFC, 47ohm	5% 1/4w 23-0013-040
R7, 23	1	RFC, 2.2K	5% 1/4w 23-0013-080
R10	1	RFC, 390ohm	5% 1/4w 23-0013-062
R14	2	RFC, 47K	5% 1/4w 23-0013-112
R18, 32	5	RFC, 100K	5% 1/4w 23-0013-120
R19, 20, 21, 22	1	RFC, 1M	5% 1/4w 23-0013-144
24	2	RFC, 5.6K	5% 1/4w 23-0013-090
R25	1	RFC, 220ohm	5% 1/4w 23-0013-056
R27, 28	1	RFC, 560ohm	5% 1/4w 23-0013-066
R35	1		
R36	1		
Q1	1	Transistor, PN5179	28-0020-000
Q2, 3, 5, 6	4	Transistor, MPS918	28-0021-000
Q4	1	FET, 2N5461	28-0382-000
L1, 5	2	Coil, Low band	50-0140-000
L1	1	Coil, High band	50-0138-000
L2	1	Coil, Low band	50-0141-000
L2, 6	2	Coil, High band	50-0139-000
L3, 7	2	Coil, Low band	50-0039-000
L3, 7	2	Coil, High band	27-0038-000
L4	1	Choke, coil, 1.2uh	27-0083-001

Receiver Assembly

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
T1, 2	2	Coil, IF, 10.7mhz	27-0040-000
T3	1	Coil, IF, 455khz	27-0041-000
Y1	1	Crystal, Rf, 3 leg	11-0002-000
Y2	1	Crystal, Common, 10.245mhz	11-0001-000
Z1	1	Filter, 10.7mhz	12-0023-000
Z3	1	Filter, Ceramic, 455khz	12-0064-000

Tone Filter Assembly 50-0392-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
		Connector, Friction Lock Block, 5 Circuit	8-0063-000
C1, 4, 5	3	CFCe, .01mfd 20% 25V	5-0024-000
C2, 3	2	Depends on Tone Freq.	
C6	1	CFE, 1.0mfd 20% 50V	5-0058-000
C7	1	CFE, 1.0mfd 20% 50V	5-0031-000
C7	1	CFE, .33mfd 20% 50V	5-0057-000
R1	1		23-0013
R2	1		23-0015
R3	1		23-0056
R4	1		23-0015
R5	1	RFC, 100K	23-0013-120
R6	1	RFC, 10K 5% 1/4w	23-0013-096
U1	1	Label, Tone Freq.	16-0197-000
		2211CP	15-0059-000

Tone Filter Test Assembly 50-0387-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
		Connector, Friction Lock Block, 5 Circuit	8-0063-000
C1, 2, 4	3	CFE, 100mfd 20% 25V	5-0216-000
C3	1	CFCe, .05mfd 20% 25V	5-0024-002
CR1, 2, 3, 4, 5, 6	6	LED, Red, Clear, V311P	28-0018-000
U1	1	IC, MC14069BCP	15-0274-000
U2	1	IC, Regulator, MC7812CT 12V	15-0012-000
R1, 3, 5, 7, 9, 11	6	RFC, 1.5M 5% 1/4w	23-0013-144
R2, 4, 6, 8, 10, 12	6	RFC, 1.5K 5% 1/4w	23-0013-076

Program Module Assembly 50-0386-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
		Connector, Friction Lock Block, 5 Circuit	8-0063-000
CR1, 2, 3, 4, 5, 6	6	Diode, Signal, 1N4148	28-0017-000

Decoder Module 50-0388-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
		Connector, Friction, 5 circuit	8-0063-000
C1, 5	2	CFCe, 1mfd 20% 50V	5-0031-000
C2, 6, 7, 8	4	DFF, 1mfd 10% 100V	5-0036-000
C3	1	CFCe, .01mfd 20% 25V	5-0024-000
C4	1	CFCe, .05mfd 20% 25V	5-0024-002
C9	1	CFCe, 100mfd 20% 25V	5-0216-000
C10	1	CFCe, .1mfd 20% 12V	5-0026-000
C11	1	CFCe, 10mfd 20% 50V	5-0215-000
CR1	1	Diode signal, 1N4148	28-0017-000
CR3	1	Diode signal 1N4148	28-0017-000
CR2, 4, 5, 7	3	Diode signal, 1N4148	28-0017-000
CR5	1	LED, Red, Clear, V311P	28-0018-000
U1	1	IC, MC14069U	15-0274-000
U2	1	IC, MC14050	15-0009-000
U3	1	IC, MC14073	15-0408-000
U4	1	IC, MC1455P	15-0196-000
U5	1	IC, Regulator, MC7812CT 12V	15-0012-000
R1, 4, 9, 11, 15, 16	6	RFC, 100K 5% 1/4W	23-0013-120
R2	1	RFC, 1.2M 5% 1/4W	23-0013-146
R2	1	RFMF, 845K 1% 1/4W	23-0015-185
R2	1	RFMF, 1.15M 1% 1/4W	23-0015-198
R2	1	RFMF, 1.91M 1% 1/4W	23-0015-219
R3	1	RFC, 470K 5% 1/4W	23-0013-136
R3	1	RFMF, 2.49M 1% 1/4W	23-0015-230
R3	1	RFMF, 1.5M 1% 1/4W	23-0015-194
R3	1	RFMF, 1.91M 1% 1/4W	23-0015-219
R5	1	RFC, 1.8M 5% 1/4W	23-0013-150
R6	1	RFC, 220K 5% 1/4W	23-0013-138
R7	1	RFMF, 2.55M 1% 1/4W	23-0015-231
R8	1	RFC, 3.3K 5% 1/4W	23-0013-084
R8	1	RFMF, 357K 1% 1/4W	23-0015-149
R10	1	RFC, 120K 5% 1/4W	23-0013-122
R10	1	RFMF, 2.0M 1% 1/4W	23-0015-221
R10	1	RFMF, 750K 1% 1/4W	23-0015-180
R10	1	RFMF, 453K 1% 1/4W	23-0015-159
R12	1	RFMF, 1.5M 1% 1/4W	23-0015-194
R13	1	RFMF, 2.21M 1% 1/4W	23-0015-225

Decoder Module

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>		<u>Part #</u>
R14	1	RFC, 100K	5% 1/4w	23-0013-120
R17	1	RFC, 821ohm	5% 1/4w	23-0001-070

Cycle Timer Module Assembly 50-0389-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>		<u>Part #</u>
C1, 7	2	CFE, 22mfd	20% 16V	5-0032-000
C2, 6, 15	3	CFCe, .1mfd	20% 12V	5-0026-000
C3	1	CRT, 10mfd, Mepco	35V	5-0402-000
C4	1	CFE, 1mfd	20% 50V	5-0031-000
C5, 9, 11, 12, 13	5	CFCe, .01mfd	20% 25V	5-0024-000
C8	1	CRT, 1mfd	35V	5-0403-000
C10	1	CFCe, 47pf	20% 1000V	5-0027-001
C14	1	CFE, 100mfd	20% 25V	5-0216-000
C16	1	CFE, 47mfd	20% 16V	5-0033-000
CR1, 3, 4, 5, 7, 8, 9, 10, 11, 12	10	Diode, Signal 1N4148		28-0017-000
CR2	1	LED, Red, Clear, V311P		28-0018-000
CR6	1	LED, Green, Clear		28-0018-002
R1, 23	2	RFC, 820ohm	5% 1/4w	23-0013-070
R2	1	RFC, 18K	5% 1/4w	23-0013-102
R3	1	RFC, 10K	5% 1/4w	23-0013-096
R4, 16, 18, 21	4	RFC, 220ohm	5% 1/4w	23-0013-056
R5	1	RVD, Potentiometer, 1M	20%	23-0404-000
R6, 11	2	RFC, 1K	5% 1/4w	23-0013-072
R7, 12	2	RFMF, 124K	1% 1/4w	23-0015-105
R8, 9	2	RFMF, 499K	1% 1/4w	23-0015-163
R10, 15	2	RFMF, 100K	1% 1/4w	23-0015-096
R13, 14	2	RFMF, 249K	1% 1/4w	23-0015-134
R17	1	RFC, 1.5M	5% 1/4w	23-0013-148
R19	1	RFMF, 200K	1% 1/4w	23-0015-125
R20	1	RFC, 1M	5% 1/4w	23-0013-144
R22, 24	2	RFC, 15K	5% 1/4w	23-0013-100
R25	1	RFC, 47K	5% 1/4w	23-0013-112
R26	1	RFC, 330K	5% 1/4w	23-0013-132
R27	1	RFC, 220K	5% 1/4w	23-0013-128
U1	1	IC, MC14081		15-0086-000
U2	1	IC, MC14011		15-0008-000
U3	1	IC, MC1455P1		15-0196-000
U4	1	IC, 2240CP		15-0405-000
U5	1	Regulator, MC7812CT	12V	15-0012-000

Steady Timer Module Assembly 50-0390-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>			<u>Part #</u>
C4	1	CFE, 1mfd	20%	50v	5-0031-000
C5, 9, 11, 12, 13	5	CFCe, .01mfd	20%	25v	5-0024-000
C6, 15	2	CFE, .1mfd	20%	12v	5-0026-000
C7	1	CFE, 22mfd	20%	16v	5-0032-000
C8	1	CFT, 1mfd, Tant.	20%	35v	5-0403-000
C10	1	CFCe, 47pf	20%	1000v	5-0027-001
C14	1	CFE, 100mfd	20%	25v	5-0216-000
C16	1	CFE, 47mfd	20%	16v	5-0033-000
CRL, 5, 7, 8, 9 10, 11, 12	8	Diode Signal 1N4148			28-0017-000
CR2	1	LED, Red, Clear, V311P			28-0018-000
CR6	1	LED, Green, Clear			28-0018-002
R1, 23	2	RFC, 820 ohm	5%	1/4w	23-0013-070
R3	1	RFC, 10K	5%	1/4w	23-0013-096
R16, 21	2	RFC, 220 ohm	5%	1/4w	23-0013-056
R17	1	RFC, 1.5M	5%	1/4w	23-0015-148
R18	1	RFC, 220 ohm	5%	1/4w	23-0013-056
R19	1	RFMF, 200K	1%	1/4w	23-0015-125
R20	1	RFC, 1M	5%	1/4w	23-0014-144
R22, 24	2	RFC, 15K	5%	1/4w	23-0013-100
R25	1	RFC, 47K	5%	1/4w	23-0013-112
R26	1	RFC, 330K	5%	1/4w	23-0013-132
R27	1	RFC, 220K	5%	1/4w	23-0013-128
U1	1	IC, MC14081			15-0086-000
U2	1	IC, MC14011			15-0008-000
U4	1	IC, 2240CP			15-0405-000
U5	1	Regulator, MC7812CT		12v	15-0012-000
SW1	1	Switch, 16 Pin, C&K BD08			25-0406-000
	1	Connector, Friction Lock Block, 5 Circuit			8-0063-000

Tone On/Tone Off Timer Assembly 50-0391-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>			<u>Part #</u>
	1	Connector, Friction Lock Block, 5 Circuit			8-0063-000
C1	1	CFE, 1.0mfd	20%	16v	5-0031-000
C2	1	CFCe, .01mfd	20%	25v	5-0024-000
C3, 5	2	CFCe, .1mfd	20%	12v	5-0026-000
C4	1	CFE, 100mfd	20%	25v	5-0216-000
C6	1	CFE, 47mfd	20%	16v	5-0033-000

Tone On/Tone Off Timer Assembly

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
CR1, 4, 5, 6, 7, 8	6	Diode, Signal 1N4148	28-0017-000
CR2	1	LED, Green Clear	28-0018-002
CR3	1	LED, Red, Clear, V311P	28-0018-000
U1	1	IC, MC4081	15-0086-000
U2	1	IC, MC4011	15-0008-000
U3	1	IC, Regulator, MC7812CT	12v 15-0012-000
R1, 4	2	RFC, 820 ohm	5% 1/4w 23-0013-070
R2	1	RFC, 1.5M	5% 1/4w 23-0013-148
R3, 5	2	RFC, 220 ohm	5% 1/4w 23-0013-056
R6	1	RFC, 15K	5% 1/4w 23-0013-100
R7	1	RFC, 220K	5% 1/4w 23-0013-128

Relay Driver Assembly 50-0385-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
CR1, 2	2	LED, Green, Clear	28-0018-002
CR3, 4	2	Diode Signal, 1N4148	28-0019-000
R1, 3	2	RFC, 4.7K	5% 1/4w 23-0013-088
R2, 4	2	RFC, 15K	5% 1/4w 23-0013-100
R5, 6	2	RFC, 47 ohm	10% 2w 23-0400-000
R7, 8	2	RFC, 560 ohm	5% 1/4w 23-0013-066
Q1, 2	2	Transistor, NPN, 2N3414	28-0232-000
		Connector, Friction Lock Block, 5 Circuit	8-0063-000

Base Board Sub Assembly

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
	1	Printed Wiring Board	31-0383-000
J1 thru 35	35	Connector, Header, 5 Pin	8-0399-000
J36	1	Connector, Header, 3 Pin	8-0399-001
C1, 2	2	CFE, 22mfd	20% 16v 5-0032-000

Wiring Harness 50-0446-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
	3	Connector, Wafer, 5 position	8-0401-001
	1	Connector, Wafer, 3 position	8-0401-000
	14	Connector, Molex, Bulk	8-0060-000

Sub Chassis, Bracker Heater Assembly 50-0411-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
	1	Bracket	17-0411-000
	1	Resistor, 1.5K	50w 23-0416-000
	1	Resistor, 3K	50w 23-0417-000
	1	Switch, Thermostat	25-0418-000
		Wire, Black, 22 AWG	300v 30-0293-000

Bracket Fuse & Switch Assembly 50-0410-000

<u>Circuit Symbol</u>	<u>Quantity</u>	<u>Description</u>	<u>Part #</u>
	1	Bracket, Fuse & Switch	17-0410-000
SW1	1	Switch, MPA, 106F, Alco push button, Yellow	25-0412-000
SW3	1	Switch, MPA, 106F, Alco push button, Red	25-0412-001
SW4	1	Switch, MPA, 106F, Alco push button, Black	25-0412-002
	1	Fuseholder Assembly: Fuseholder	8-0413-000

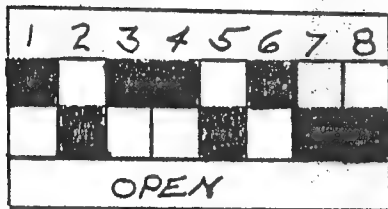
Miscellaneous

Case Assembly	050-0447-000	Relay	022-0419-000 10 AMP. 240 Volt
Yellow	050-0447-000	Transformer	027-0420-000 115 VAC
Red	050-0447-001		027-0420-001 230 VAC
Antenna		Varistor	028-0198-000
Top Deck - High band	1-0054	Terminal Strip	027-0421-000
Low band	1-0426	Y1	11-0002-1
Sub Chassis Sub Assembly	17-0409		

TIMER MODULE PROGRAMMING

SW1: Programs the total time that the function is activated. Switches add together ($\pm 10\%$) for the total time when CLOSED.

#1 = 128 sec.	#5 = 8 sec.
#2 = 64 sec.	#6 = 4 sec.
#3 = 32 sec.	#7 = 2 sec.
#4 = 16 sec.	#8 = 1 sec.



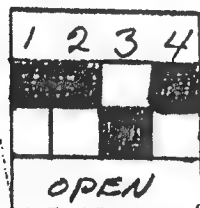
Example: 3 min. or 180 sec. = #1, #3, #4 and #6 closed.

SW2: Cycle Timer only, programs the ON TIME.

SW3: Cycle Timer only, programs the OFF TIME.

These switches add together ($\pm 10\%$) when the switches are OPEN.

#1 = 1 sec.	#3 = 4 sec.
#2 = 2 sec.	#4 = 8 sec.



Example: #3 open = 4 seconds on or off.

15 seconds is the maximum standard on or off time that is programmable without modification.

Remove Power before Removing Module

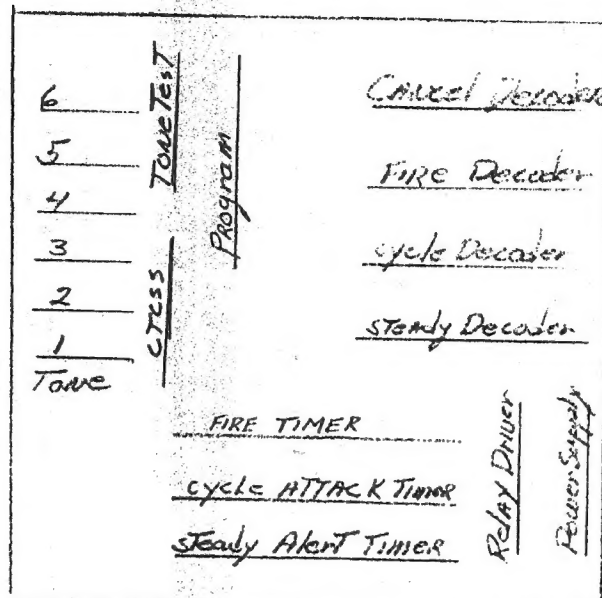
Troubleshooting Suggestions

1. The power supply module and the receiver board has a green LED indicating power applied.
2. One of the six red LED's on the tone filter test module will light when the first tone is received, another for the second tone. (Lower LED indicates the lower tone filter module in J1 is activated.) Receiver sensitivity, tone bandwidth, proper tone sequence and tone timing can be checked by these LED's. Flashing LED indicates either weak RF signal or tone off frequency.
3. The green LED on the decoder module will flash on for approximately .2 second after the proper tone code and timing has been received.
4. The red LED will light on the proper timer module when activated by the decoder module. The green LED will light during the on time as set by the programable on and off switches.
5. The one green LED of the relay driver module is on during the time the relay is closed.

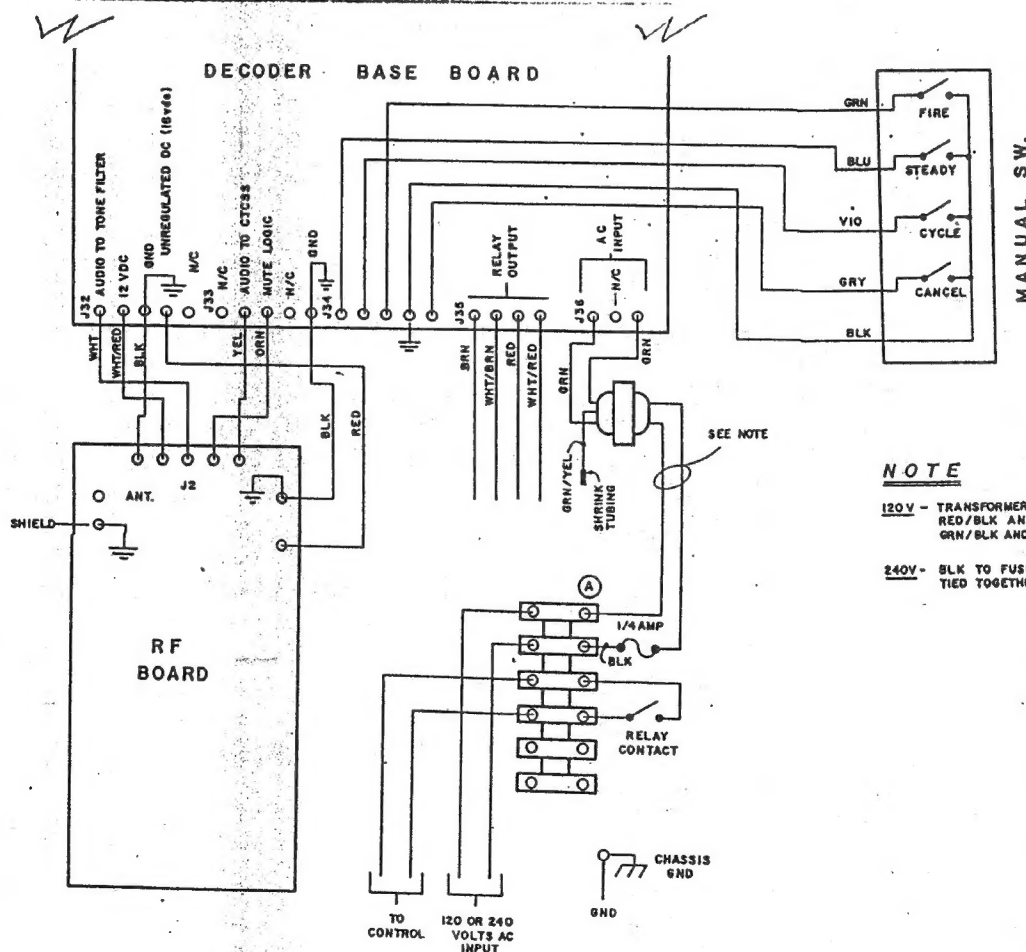
SHUT OFF AC POWER TO THE SIREN DECODER BEFORE REMOVING OR INSTALLING ANY OF THE PLUG IN MODULES. DOUBLE CHECK THAT MODULES ARE PLUGGED IN CORRECTLY BEFORE POWER IS APPLIED.

Power may be removed from all modules by one of the following ways:

1. Disconnecting AC power from external source.
2. Removing $\frac{1}{4}$ Amp decoder fuse.
3. Disconnecting transformer secondary wires at J36 on base board.



Module Placement



WIRING

Note:

DISCONNECT Power when servicing Decoder

LIMITED WARRANTY

CD&F Electronics Corporation warrants to the original purchaser each new electronic product manufactured by them to be free from defective material and workmanship. CD&F Electronics agrees to remedy any such defect or furnish a new part in exchange, providing it occurred under normal installation, use or service. Original purchaser must deliver such unit to factory intact, for examination within two (2) years from the date of shipment. This warranty applies if examination of equipment discloses, in our judgement, that unit is defective.

All units, returned to the factory within two (2) years from the date stamped on the nameplate, will be repaired without charge to the owner, if returned to the factory prepaid. All equipment will be repaired and returned prepaid by designated carrier of our choice. Advanced authorization must be given by CD&F Electronics before returning equipment in need of repair.

This warranty does not extend to any of our products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or used in violation of instructions furnished by us. This warranty does not extend to units which have been repaired by unauthorized facilities, nor to cases where the serial number thereof has been removed, defaced, or changed, nor to accessories used that are not of our manufacture.

ALL IMPLIED WARRANTIES ARE LIMITED TO A PERIOD OF TWO (2) YEARS FROM THE DATE OF SHIPMENT TO ORIGINAL PURCHASER. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

CD&F ELECTRONICS CORPORATION DISCLAIMS ANY AND ALL RESPONSIBILITY FOR CONSEQUENTIAL DAMAGES ARISING FROM A BREACH OF WARRANTY. THIS DISCLAIMER IS SUBJECT TO THE PROVISIONS OF FEDERAL OR STATE LAW IN EFFECT AT THE TIME OF SHIPMENT TO ORIGINAL PURCHASER.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. No representative or other person, natural or legal, has authority to assume any other liability for CD&F Electronics in connection with the sale of CD&F Electronics Corporation's electronics products.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

CD&F ELECTRONICS CORPORATION
P.O. Box 2
Elm Creek, NE 68836
Phone (308) 856-4750

SIREN CONTROL DECODERS WITH BATTERY BACKUP
SPECIAL HOOKUP INSTRUCTIONS.

Inside the battery cabinet of the siren, locate the battery that has its negative (-) terminal going to the common ground or zero for the siren system.

Then locate the 2nd Batteries positive terminal (24 to 27.5 vdc) measured from the 1st battery negative terminal (-).

These are the ground and +24vdc wires to be connected to the battery terminals on the board above the relays in the control decoder.

